

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 202-01		FOR FURTHER ACTION See Form PCT/IPEA/416																									
International application No. PCT/SE2004/000445		International filing date (day/month/year) 24.03.2004	Priority date (day/month/year) 14.04.2003																								
International Patent Classification (IPC) or national classification and IPC F01N 3/031, F01N 3/033																											
Applicant Scania CV Aktiebolag (publ) et al																											
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>2</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <table border="0"><tr><td><input checked="" type="checkbox"/></td><td>Box No. I</td><td>Basis of the report</td></tr><tr><td><input type="checkbox"/></td><td>Box No. II</td><td>Priority</td></tr><tr><td><input type="checkbox"/></td><td>Box No. III</td><td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td><input type="checkbox"/></td><td>Box No. IV</td><td>Lack of unity of invention</td></tr><tr><td><input checked="" type="checkbox"/></td><td>Box No. V</td><td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VI</td><td>Certain documents cited</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VII</td><td>Certain defects in the international application</td></tr><tr><td><input checked="" type="checkbox"/></td><td>Box No. VIII</td><td>Certain observations on the international application</td></tr></table>				<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand 21.10.2004		Date of completion of this report 18.07.2005																									
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88 Form PCT/IPEA/409 (cover sheet) (January 2004)		Authorized officer Lars Wallentin / MRO Telephone No. +46 8 782 25 00																									

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2004/000445

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 8 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* 8 - 9 _____ received by this Authority on 10.03.2005
- pages* _____ received by this Authority on _____
- ☒ the drawings:
- pages 1 - 2 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to the sequence listing (specify): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to the sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2004/000445

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims

1-12

YES

Claims

NO

Inventive step (IS)

Claims

YES

Claims

1-12

NO

Industrial applicability (IA)

Claims

1-12

YES

Claims

NO

2. Citations and explanations (Rule 70.7)

The invention according to the claims relates to a method and a particle filter adapted for spontaneous regeneration. The exhaust gas flow is bypassed when the filter differential pressure exceeds a certain level. In this way filter ignition due to a critical particle level can be avoided.

Cited documents:

D1: US5138835

D2: WO03074846

Document D1 is considered to represent the closest prior art. It discloses a diesel engine exhaust gas filter (4 in figure 1) with a bypass (8). The bypass flow is activated when a predetermined upper exhaust gas filter differential pressure is measured by a measuring device (7). The measuring device includes a piston (12 in figure 2) which is displaced against the pressure of a spring (16).

The invention according to claim 1 differs from the filter in D1 in that it and the bypass are contained in a silencer housing. Due to this feature silencing is achieved both in normal operation and when bypassing.

It is known in the art with filters encased in silencers. See for instance D2 which discloses a filter with two different flow paths, one with a filter and one bypass flow path without a filter (see the abstract). The filter can be encased in a silencer, see claim 44.

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: BOX V

Consequently, a solution to the problem described is known from document D2.

It is therefore considered obvious to a person skilled in the art to use the teachings of D1 together with prior-art as specified in D2 in order to achieve the silencing of the filter in both normal and bypass mode. Further, the description and the answer to the written opinion lack statements why it should be non-obvious to a person skilled in the art to do this combination. Accordingly, the method of claim 1 lacks an inventive step.

The device according to claim 6 includes the same characteristics as the method according to claim 1. Therefore, it follows from the arguments stated that the device according to claim 6 lacks an inventive step.

The characteristics of claims 2-4 and 7-9 are all known from D1. Therefore the invention according to claims 2-4 and 7-9 also lack an inventive step.

Further, it is considered obvious to a person skilled in the art that a catalyst can be placed before the filter and that it should be independent of bypassing. The advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claims 5 and 10 lacks an inventive step.

It also follows from the arguments stated that the silencer according to claim 11 and the vehicle according to claim 12 lacks an inventive step.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2004/000445

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claim 12 relates incorrectly to a silencer according to claim 13. It is assumed that claim 12 is meant to relate to the silencer of claim 11.

CLAIMS:

1. A method pertaining to a particle filter (3) for an exhaust system of a combustion engine whereby the filter (3) is regenerated by spontaneous combustion of particles accumulated in the filter and whereby the exhaust gases from the combustion engine in operation are led past the filter (3) when the counterpressure in the exhaust gases which is caused by the filter (3) exceeds a certain level, **characterised** in that the exhaust gases are led past the filter (3) through a space inside a silencer (1) which encloses the filter (3).
2. A method according to claim 1, **characterised** in that exhaust gases from the combustion engine are led past the filter (3) through a valve (4) which opens when the counterpressure in the exhaust gases is above said level.
3. A method according to claim 2, **characterised** in that the valve (4) opens because of the action of the pressure of the exhaust gases against a holding-back spring (13;16).
4. A method according to claim 1 or 2, **characterised** in that said counterpressure is detected by at least one pressure sensor (17) whose output signals are used for controlling (CDU) the bypassing of the filter.
5. A method according to any one of the foregoing claims, **characterised** in that the exhaust gases are caused to pass through a catalyst (2) even during bypassing of the filter (3).
6. A device pertaining to a particle filter (3) for an exhaust system of a combustion engine whereby the filter (3) is adapted to being regenerated by spontaneous combustion of particles accumulated in the filter and whereby a bypass duct via which exhaust gases from the combustion engine in operation are arranged to be led past the filter (3) when the counterpressure in the exhaust gases which is caused by the filter (3) exceeds a certain level, **characterised** in that the exhaust gases are led past the filter (3) through a space inside a silencer (1) which encloses the filter (3).

7. A device according to claim 6, **characterised** by a valve (4) which is arranged to open when the counterpressure in the exhaust gases is above said level, in order to lead exhaust gases from the combustion engine past the filter (3).
- 5 8. A device according to claim 7, **characterised** in that the valve (4) is provided with a holding-back spring (13;16) which the pressure of the exhaust gases acts against.
9. A device according to claim 6 or 7, **characterised** by at least one pressure sensor (17) for detecting said counterpressure, the output signals from which are arranged to
10 be used for controlling (CDU) the bypassing of the filter (3).
10. A device according to any one of claims 6 - 9, **characterised** by means for causing the exhaust gases to pass through a catalyst (2) even during bypassing of the filter (3).
- 15 11. A silencer (1) which comprises a device according to any one of claims 6 - 10.
12. A vehicle which is driven by combustion engine and comprises at least one silencer (1) according to claim 13.